CHAPTER 10
HIGHLIGHTS AND SIDELIGHTS

The Camels and the Corps: Lieutenant William H. Echols's Reconnaissance of West Texas

The deeper one delves into the history of the Corps, the more one is amazed by the variety and scope of the Engineers' experiences. A current motion picture calls to mind one unusual and little-known episode, the short-lived experiment with camels. The movie "Hawmps" is a comedy, but testing the dromedaries, imported at the behest of Secretary of War Jefferson Davis for use on the frontier, was no laughing matter to Engineer Lieutenant William H. Echols.

Fresh out of the Military Academy in 1858, Echols led two reconnaissances through rugged, arid portions of Colonel Robert E. Lee's Department of Texas. With his supplies lashed to the backs of camels, Echols pushed into the Big Bend wilderness. Soldiers hated the hump-backs—they groaned, bit, spat, and stank—but Echols respected their toughness. "No such march as this," he wrote near Fort Davis, "could be made with any security without them." His efforts, among the earliest field tests of the camels, were nullified when the onset of the Civil War shifted attention from the frontier. The camels were turned loose to run wild, and Echols returned to tamer pursuits. Unsung and unknown, this young Engineer played a central part in one of the more novel chapters of the Corps' complex history.

Frank N. Schubert

Source: (1) William H. Echols, *Diary of a Reconnaissance of Country Between the El Paso Road and the Rio Grande River,* S. Ex. Doc. 1, 36th Cong., 2d sess. (2) Odie B. Faulk, *The U. S. Camel Corps, An Army Experiment* (New York: Oxford University Press, 1976).

The "Great Abstraction": the Corps and the Washington Monument

Americans are indebted to the Army Engineers for the present form of the Washington Monument. At the end of the Civil War, architect Robert Mills' monument was a mere stump on the Mall, abandoned by its builders 20 years earlier and ridiculed by Mark Twain as "the memorial Chimney" and "a factory chimney with the top broken off." Around its base pigs rooted and cattle grazed; shacks and boat hulks rotted at the nearby river's edge.

In 1872, Engineers of the newly-created Office of Public Buildings and Grounds drained the area, graded it, and surrounded it with a carriage drive. Then, in 1876, as part of the national centennial, Congress appropriated funds to complete the Monument. Lieutenant Colonel Thomas Lincoln Casey (later Chief of Engineers) examined the foundation and discovered it could not support the design shaft. "If liberality among the people had enabled the Monument Society to complete its work," dryly remarked one of Casey's officers, "something startling would have happened."

Aided by Corps civilian Bernard Richardson Green, Casey enlarged and strengthened the base. Since the architect had designed an obelisk, he next wrote to the U. S. ambassador to Italy to secure the correct proportions. Finding the original proportions in error, he redesigned for a height of 555 feet. He preserved the stark simplicity of the obelisk infuriating Gilded Age architects, devotees of gingerbread design, who termed the result "one of the blankest, meanest, ugliest, and most unmeaning piles that ever encumbered the globe." Hence the "great abstraction" on the Mall owed its classic form to the Engineers.

A fitting conclusion to Casey's work came on 6 December 1884, when he joined Green on a wooden platform atop the Monument. Bracing themselves against a winter gale, the two Engineers watched their foreman add the tip: a little pyramid weighing 100 ounces, the largest piece of aluminum yet cast in the New World. Engraved on it were the words: "Chief Engineer and Architect, Colonel Thomas Lincoln Casey, Corps of Engineers."

Albert E. Cowdrey

Source: Albert E. Cowdrey, *A City for the Nation.*

The Final Voyage of the U.S.S. Maine

The Army Engineers have had a long association with harbors and harbor improvements, but nothing in their history quite compares

with the unusual job assigned them in 1910—to raise the battleship *Maine* from Havana harbor.

On the hot, dark, still night of 15 February 1898, a mysterious explosion ripped through the forward magazines of the U.S.S. *Maine,* moored off Havana, Cuba, then a Spanish territory. The force of the detonation seemed to lift the 6,682-ton ship half out of the water, before sending its twisted and blackened mass to the bottom. With it went the lives of over 250 men and whatever hope remained for continued peace between the United States and Spain. The sinking provoked a bellicose outcry from Americans and galvanized them for a brief, victorious war that wrested Cuba and other colonies from Spanish control.

For a decade after the war, the *Maine* lay at the bottom of the harbor. Then, in 1910, Congress decided to raise the warship, and the Secretary of War assigned the task to the Corps of Engineers. Working under the direction of Major Harley B. Ferguson, the Engineers first built a large elliptical cofferdam comprised of twenty interlocking steel cyclinders, each 50 feet in diameter and containing about 150 piles. The cofferdam extended downward throught 37 feet of water and another 15 to 24 feet of soft mud, in which the *Maine* was mired.

Building the cofferdam took 11 months. While constructing it, the Corps had to cope with many difficulties: faulty equipment, poor weather, uncertain Congressional support, and annoying souvenir hunters. But by November 1911, the Engineers were ready to pump the water out of the giant cofferdam and expose the wreck. A court of inquiry then conducted an investigation which showed that the fatal explosion had come from the outside. Once the examination was over, the Engineers removed the remains of 60 men trapped in the sunken vessel and prepared the *Maine* for its final voyage.

In February 1912, fourteen years after the explosion, the Engineers refilled the cofferdam with water. The multilated hull broke free from the mud and floated. One month later, a tug towed the *Maine* to deep water beyond the three-mile limit. There the Navy gave the ill-fated battleship an "honourable burial beneath the waves."

Charles E. Walker

Source: (1) Jack Hammersmith, "The United States Army Corps of Engineers in the Spanish-American War," (MS in Historical Division). (2) Donald Barr Chidsey, *The Spanish-American War* (New York, 1971), 54 - 63. (3) Margaret Leech, *In the Days of McKinley* (New York, 1959), 163 - 80.

Where the Hens Laid Hard-Boiled Eggs: Lieutenant Derby at Fort Yuma

For Engineers as for other soldiers, service in the frontier Army often meant duty at remote and dreary posts. Fort Yuma, in the middle of a parched wasteland populated by unfriendly Indians, was such a place. Many soldiers and officers passed through the fort, but none more vividly described the desolation than the topographer and humorist Lieutenant George H. Derby.

An 1846 West Point graduate and a veteran of the Mexican War, Derby went to Yuma in 1850 while on an exploration of the Colorado River. Although he arrived in mid-winter, it was hot; the mean December temperature was a blistering ninety-two degrees. Referring to Yuma as the place where "hens lay hard-boiled eggs," Derby went on to spin the following yarn passed down to us by Mark Twain: "There is a tradition that a very, very wicked soldier died there once, and of course went straight to the hottest corner of perdition—and the next day he telegraphed back for his blankets."

Later, in one of his humorous essays on astronomy, published under the pen name John Phoenix, Derby had more to say about Fort Yuma. This time he considered the desirability of establishing a post in another inhospitable clime—on the planet Mercury:

> [Mercury] receives six and a half times as much heat from the sun as we do; from which we conclude that the climate must be very similar to that of Fort Yuma, on the Colorado River. The difficulty of communication with Mercury will probably prevent its ever being selected as a military post, though it possesses many advantages for that purpose, being extremely inaccessible, inconvenient, and, doubtless, singularly uncomfortable.

Derby accomplished much more than a memorable description of an isolated outpost. By proving that the Colorado River was navigable as far as Fort Yuma, he cleared the way for regular water-borne shipments to the post, thus insuring its continued service to the many pioneers who took the southern route to the Calfornia goldfields.

Frank N. Schubert

Source: (1) George R. Stewart, *John Phoenix, Esq., The Veritable Squibob* (New York: Henry Holt and Company, Inc., 1937), 71. (2) John Phoenix, *The Squibob Papers* (New York: Carleton, Publisher, 1865), 20. (3) John Phoenix, *Phoenixiana* (New York: D. Appleton and Company, 1856), 59.

Maps for NASA

In the late 1950's the probability that the National Aeronautics and Space Administration (NASA) would before long send men to the moon made it of the utmost importance that adequate maps be prepared for exploring this new territory. The astronauts would have to know which crater they were landing in and what lay beyond the horizon. Landing and lauching sites would have to be fixed precisely. Since the moon had no magnetic field, a compass would be useless, and a general idea of direction would in itself be of little help.

In 1958, the Army Map Service of the Corps of Engineers began to investigate the feasibility of preparing a topographic map of the moon at a scale of 1:1,000,000 based on telescopic photographs of the moon's surface. The engineer topographers concluded that reconnaissance-type photomaps at a scale of 1:5,000,000 were feasible. Such maps would show only the most general terrain features.

There would be great difficulties. The moon was a quarter of a million miles away, and photomaps of the earth were made from photographs taken at the most from a height of 6 miles. The usual technique of juxtaposing photographs taken from slightly different angles and viewing them in special stereoscopic equipment to get a three dimensional effect, necessary for determining the elevation of terrain features, was well-nigh useless because all pictures of any part of the moon taken from any point on the earth were practically identical. Another matter to be settled was the establishment of fixed references points on the moon by which explorers could determine the elevation, latitude, and longitude of the place where they were.

The topographers' first attempts to make a map failed. The moon was too far away and too big. Old photomapping techniques and equipment were modified and improved. New techniques were devised. A closed circuit television apparatus was developed to enable map makers to see lunar features under different conditions of light and shadow, which made it possible to determine with greater accuracy the height of various terrain features.

The lunar map the Army Map Service finally developed represented the visible surface of the moon at a scale of 1:5,000,000. Topographic features were shown with 1,000-meter contours, and in some cases with 500-meter contours. The map identified some 5,000 terrain features. Certain small areas were mapped in greater detail. Proposed NASA landing sites were mapped at a scale of 1:250,000 with color tints added to show the colors the astronauts were likely to see on approaching a particular site.

The topographers made rubber or plastic three-dimensional models of parts of the moon's surface to be used in connection with simulated landings, which the astronauts practised in NASA's experimental stations. The models were photograghed to indicate various altitudes and the resulting films were projected on large screens to

show how the moon would look to men riding past at such altitudes. A problem was to find a material on which to print maps which could withstand the moon's extreme temperatures ranging from 214 degress above to 250 degrees below zero and which could be folded to fit into an astronaut's pocket. Plastic and rubber compounds were developed in an attempt to find a solution.

Thus, the topographic engineers undertook a task of vital importance to NASA. Constant improvements were made in an effort to produce better moon maps. With photographic equipment subsequently installed in satellites orbiting far above the earth, the preparation of far better maps was possible.

Karl C. Dod

Source: T. J. Hayes, III, "Army Engineers Map the Moon," *Army Information Digest*, (January 1965), 12 - 17.

A Case of Mistaken Identity: the Groves That Moved

Appearances could be deceiving, even in the Platte River valley, which in 1842 was already known for its predictability. Through this treeless grassland so flat that only the curvature of the earth limited vision, Lieutenant John C. Fremont of the Topographical Engineers and his small exploring party rode serenely toward South Pass, the Rocky Mountain gateway to Oregon. But even the unchanging Platte valley had its surprises. When cartographer Charles Preuss saw three large groves of trees, he was indeed startled. Overcoming his astonishment, he reined in his mule and reached for his notebook. Here was a significant landmark for his map of the route. As he began to write, he got another surprise: the trees began to move. "My woods," said Preuss ruefully in his diary, "which would have looked nice on the map, turned out to be three immense herds of buffalo." The Platte valley held no surprises after all.

Frank N. Schubert

Source: Allen Nevins, ed., *Narratives of Exploration and Adventure by John Charles Fremont* (New York: Longmans, Green & Co., 1956); Charles Preuss, *Exploring with Fremont, The Private Diaries of Charles Preuss* (Norman: University of Oklahoma Press, 1958).